

James Smith - Comments submitted on the proposed TMDL for Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay

From: "Sarah Connick" <SConnick@suscon.org>
To: <jsmith@waterboards.ca.gov>
Date: 4/26/2005 12:16 PM
Subject: Comments submitted on the proposed TMDL for Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay
CC: "Connie Liao" <cliao@suscon.org>

James,

Attached for your information is a letter containing comments on the proposed TMDL for Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay, and a copy of the most recent update on the Brake Pad Partnership. I am sending a hard copy on letterhead by regular mail for inclusion in your Board members' packets, but wanted to let you see the comments as soon as possible.

Please contact me if you have any questions regarding these comments, the Brake Pad Partnership, or Sustainable Conservation.

Best regards,

Sarah Connick, Ph.D.
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The Brake Pad Partnership is a multistakeholder effort to understand the impacts on the environment that may arise from brake pad wear debris generated in the use of passenger vehicles. Manufacturers, regulators, stormwater management agencies, and environmentalists are working together to understand the impacts that may arise from brake pad wear debris generated by passenger vehicles on the environment. BPP efforts are aimed at developing an approach for evaluating potential impacts of copper from brake pads affecting water quality in the South San Francisco Bay as an example. Brake pad manufacturers have committed to adding this evaluation approach to their existing practices for designing products that are safe for the environment while still meeting the performance requirements demanded of these important safety-related products.

Mark Your Calendars!

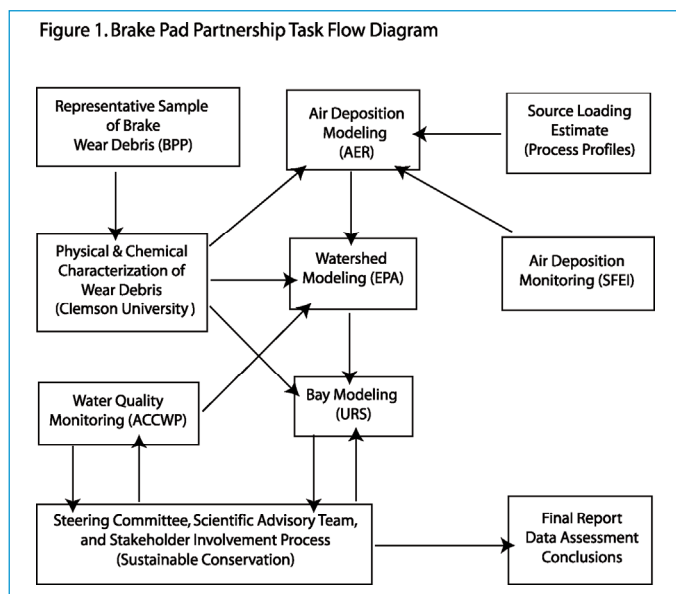
Stakeholder Conference Scheduled

The next Stakeholder Conference is scheduled for June 22, 2005, and will be hosted by the Pacific Gas and Electric Company (PG&E) in San Francisco. If you would like to attend or receive materials from the meeting, please contact Brake Pad Partnership Project Manager Connie Liu at (415) 977-0380, ext. 336 or cliu@suscon.org.

BPP Technical Studies Update

The Brake Pad Partnership (BPP) is conducting a set of interlinked laboratory, environmental monitoring, and environmental modeling studies to understand the fate and transport of copper from automobile brake pad wear debris in the environment. Figure 1 illustrates the relationship among the studies.

At the core of the Partnership's effort are three environmental modeling studies:



- **Air Deposition Modeling**—to predict how much brake pad wear debris is released and deposited in the study watershed (Castro Valley).
- **Watershed Modeling**—to estimate how much copper from the deposited wear debris washes into the storm drainage system and eventually reaches the waters of the South San Francisco Bay.
- **Bay Modeling**—to determine whether and, if so, to what extent copper from brake pad wear debris affects short- and long-term concentrations of copper in the bay.

In support of these modeling efforts, the Partnership is conducting additional studies to develop accurate input data for the models. An air deposition monitoring effort will provide data necessary for comparison of the model results with the data values as a part of the air deposition model evaluation. Stormwater monitoring data are being collected to help calibrate and validate the watershed modeling. In addition, the Partnership is conducting physical and chemical characterization analyses to determine model parameters specific to brake pad wear debris.

Since the last BPP Update in August 2004, the Partnership has made substantial progress in its work on air deposition monitoring, generation and characterization of a representative sample of brake pad wear debris, estimating the amount of copper released to the watershed from brake and nonbrake sources, water quality monitoring, and watershed modeling.

Steering Committee

Rodger Dabish, TMD Friction Inc.

Michael Endicott, Sierra Club

Tim Merkel, Ph.D., Consultant,
Representing friction material
manufacturers

Kelly Moran, Ph.D., TDC
Environmental, LLC, Representing
the Bay Area Stormwater
Management Agencies Association

Jim Pendergast, U.S.
Environmental Protection Agency

Mark Phipps, Ph.D., Federal
Mogul Corporation, Chair,
Brake Manufacturers Council-
Product Environmental Committee
(BMC-PEC)

Chris Shepley, M.R.S.C.
Brake Parts, Inc.

Project Manager:

Connie Liu
Sustainable Conservation

Facilitator:

Sarah Connick, Ph.D.
Sustainable Conservation

Technical Advisor:

Mark Schlautman, Ph.D.
Clemson University

Air Deposition Monitoring Expanded

Don Yee and his colleagues at the San Francisco Estuary Institute (SFEI) completed the collection of wet and dry deposition samples at the end of February 2005. In addition, under the advice of the air deposition modelers, Betty Pun and Christian Seigneur of Atmospheric and Environmental Research, Inc., SFEI began measuring ambient air concentrations of benzene in November. The idea is to use benzene as a tracer of vehicle traffic, with the expectation that higher benzene levels would be found at the sampling site adjacent to the freeway off-ramp, and lower levels would be found at the reservoir site that is more remote from roads. The benzene samples are being taken at the same time and location as the dry deposition samples, and may provide the BPP with sufficient information to apportion the copper found in the dry deposition samples to vehicle and nonvehicle sources.

Characterization of Airborne Brake Pad Wear Debris Completed

Clemson University researchers Christos Christoforou, Mark Schlautman, and colleagues completed the characterization of a representative sample of airborne brake pad wear debris and the BPP's Scientific Advisory Team conducted a stakeholder and independent expert review of their work.

The researchers found that the generation of airborne brake pad wear debris varied significantly for the three different materials that comprise the representative sample, with the material that generated the most airborne brake pad wear debris producing nearly 15 times as much wear debris as the one that generated the least. The mass mean aerodynamic diameter of the representative sample of airborne brake pad wear debris was approximately 2.7 μm . A copy of the report can be found on the BPP's website at: <http://www.suscon.org/brakepad/pdfs/ADPSD%20Final%20Report%2001-28-05.pdf>

Characterization of Nonairborne Brake Pad Wear Debris Underway

The generation of a representative sample of nonairborne brake pad wear debris was completed at Link Test Laboratory in November 2004. This procedure captured the brake pad wear debris that collected on the test apparatus and the surface below. Clemson University researchers are now conducting total copper, solubility, and leaching tests on this material.

Estimating Copper Loads to the Watershed

One of the most critical inputs to the modeling effort will be the development of sound estimates of the amount of copper released in brake pad wear debris to the study watershed. The BPP contracted with Kirsten Rosselot of Process Profiles to work with the Steering Committee in carrying out this work.

In October 2004, the BPP's Scientific Advisory Team conducted a stakeholder and independent expert review of the work plan for estimating copper loads from vehicle brake sources. The review process resulted in a heightened awareness of the importance of the BPP's use of sensitivity analyses to understand how uncertainty around different pieces of information may affect the efforts' overall results. Process Profiles is now preparing the draft report, which will be available for stakeholder and independent expert review in late March 2005. The final Work Plan is now available on the Partnership's website at: <http://www.suscon.org/brakepad/pdfs/Final%20WkPIn%20Estimating%20Copper.pdf>.

Process Profiles is also developing information on the estimates of copper loadings from nonbrake sources to the watershed. The draft work plan for this work was made available for stakeholder and independent expert review in mid-February 2005.

BPP Scientific Advisory Team

Jerry Schubel, Ph.D., Aquarium of the Pacific, co-chair
Mark Schlautman, Ph.D. Clemson University, co-chair
John Sansalone, Ph.D., Department of Civil and Environmental Engineering, Louisiana State University

Characterization of Airborne Brake Pad Wear Debris:

Thomas A. Cahill, Ph.D., Department of Applied Science, University of California at Davis
Michael Robert, Department of Civil and Environmental Engineering, University of California at Davis
Glynis Lough, Ph.D., Environmental Chemistry and Technology Program, University of Wisconsin-Madison

Estimating Copper Loadings to the Watershed:

Robert A. Frosch, Ph.D., Belfer Center for Science and International Affairs, Harvard University

Water Quality Monitoring:

Robert Holmes, Central Valley Regional Water Quality Control Board
Arthur J. Horowitz, U.S. Geological Survey
William Selbig, U.S. Geological Survey

Watershed Modeling:

Robert Ambrose, Ph.D., National Exposure Research Laboratory, U.S. Environmental Protection Agency
Wayne Huber, Ph.D., Department of Water Resources Engineering, Oregon State University
Ken Schiff, Southern California Coastal Water Research Project

Water Quality Monitoring Report Technical Review in Process

The draft results of the 2003-2004 Castro Valley Creek Water Quality Monitoring Project are now undergoing stakeholder and independent scientific review. A draft of the report and current information on the review process is available on the Partnership's website at: <http://www.suscon.org/brakepad/documents.asp>.

Watershed Modeling Work Plan Completed

The BPP's watershed modeling effort is being conducted by Jim Carleton of the U.S. Environmental Protection Agency. In October 2004, the BPP's Scientific Advisory Team conducted a stakeholder and independent expert review of the draft work plan for watershed modeling. The process involved several teleconferences with the reviewers, Steering Committee, technical team members, and interested stakeholders. As a result of these discussions, the BPP revised and improved its watershed modeling approach. A copy of the final work plan for watershed modeling is available on the BPP's website at: <http://www.suscon.org/brakepad/pdfs/Final%20Work%20Plan%20for%20Watershed%20Modeling%20Study.pdf>.

| TECHNICAL WORK PRODUCT REVIEW STATUS | |
|---|---|
| TECHNICAL WORK PRODUCT | REVIEW STATUS |
| Air Deposition Modeling (AER, Inc.) Work Plan Report | Finalized January 2004 Draft report due July 13, 2005 |
| Watershed Modeling (U.S. EPA) Work Plan Report | Finalized November 2004 Draft report due December 20, 2005 |
| Bay Modeling (URS Corporation) Work Plan Report | Draft work plan due August 26, 2005 Draft report due August 15, 2006 |
| Characterization of Airborne Brake Pad Wear Debris (Clemson University) Work Plan Report | Finalized May 2004 Finalized January 2005 |
| Chemical Characterization of Brake Pad Wear Debris (Clemson University) Work Plan Report Additional work | N/A Draft report now under review TBD |
| Loading Estimate of Copper from Brake Pads (Process Profiles) Work Plan Report | Finalized Draft report due March 28, 2005 |
| Loading Estimate of Copper from Nonbrake Sources (Process Profiles) Work Plan Report | Draft work plan now under review Draft report due April 22, 2005 |
| Water Quality Monitoring (Alameda Countywide Clean Water Program) Work Plan Report | No work plan required Draft report now available for review |
| Air Deposition Monitoring (SFEI) Work Plan Report | Finalized January 2004 Draft report due April 4, 2005 |
| Project Management and Final Report (Sustainable Conservation) Operations and Communications Plan Final Report | Finalized March 2004 Draft report anticipated December 2006 |

Model Year 2003 Copper Use Data Now Available

The Brake Manufacturers Council Product Environmental Committee reported data on the use of copper in the top 25 best selling vehicles for model year 2003. The data indicate there was little change in copper used in vehicle brakes in comparison to the previous year, although copper use has increased by about 90 percent since the voluntary monitoring program began in 1998. The Copper Use Monitoring Program Results for Model Years 1998-2003 is available on the Partnership's website at: <http://www.suscon.org/brakepad/pdfs/CuUMP%20Final%20Report%2012-03-04.pdf>.

Interested in Getting Involved in the Brake Pad Partnership?

For information on how to participate in the Brake Pad Partnership's (BPP) efforts, please subscribe to the BPP list-serve. You will receive project updates, information on the availability of draft and final reports and the opportunity to provide your input, along with information on upcoming stakeholder events. To subscribe, please send a blank e-mail to: BPP-list-serve-subscribe@topica.com. Use of the BPP list-serve is reserved exclusively for disseminating and sharing information about the BPP.

Technical Consultants

Air Deposition Modeling

Atmospheric and Environmental Research, Inc.

Bay Modeling

URS Corporation

Watershed Modeling

Office of Water, U.S. Environmental Protection Agency

Air Deposition Monitoring

San Francisco Estuary Institute

Estimation of Copper from Brake and Nonbrake Sources

Process Profiles

Stormwater Monitoring

Alameda Countywide Clean Water Program

Chemical and Physical Characterization of Brake Pad Wear Debris

Clemson University

Project Coordination and Technical Management

Sustainable Conservation

Project Contracting and Fiscal Management

San Francisco Estuary Project

Funding for this project has been provided in full or in part through an Agreement with the State Water Resources Control Board (SWRCB) pursuant to the Costa-Machado Water Act of 2000 (Proposition 13) and any amendments thereto for the implementation of California's Nonpoint Source Pollution Control Program. The contents of this document do not necessarily reflect the views and policies of the SWRCB, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

Additional in-kind and financial support for this project has been provided by: Association of Bay Area Governments, Bay Area Stormwater Management Agencies Association, Brake Manufacturers Council Product Environment Committee, Bradford M. Endicott Charitable Lead Trust, Fred Gellert Family Foundation, Lisa and Douglas Goldman Foundation, David H. Liu Foundation, Pacific Gas and Electric Company, City of Sacramento, Robert and Patricia Swtzer Foundation, U.S. Environmental Protection Agency.

April 26, 2005

Mr. James Smith, Environmental Scientist
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Dear Mr. Smith,

As the facilitator and coordinator of the Brake Pad Partnership, it has come to my attention that the Basin Plan Amendment now under consideration by the San Diego Regional Water Quality Control Board (SD RWQCB)—incorporation of the Total Maximum Daily Load (TMDL) for Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay—has important relevance to the work of the Brake Pad Partnership. The Brake Pad Partnership is a multi-stakeholder effort to understand and address as necessary the impacts on stormwater and surface water quality that may arise from brake pad wear debris generated in the use of passenger vehicles. Since 1997, brake pad manufacturers, water quality regulators, stormwater managers, and environmental groups have been working together to evaluate the potential impacts of copper from brake pads on water quality in the San Francisco Bay.

The Brake Pad Partnership is a component of the implementation plans for addressing copper impairment listings in the San Francisco Bay Area. In June 2002, the San Francisco Bay Regional Water Quality Control Board promulgated site-specific objectives for dissolved copper in the San Francisco Bay south of Dumbarton Bridge and established requirements that local stormwater managers and point source dischargers implement a set of actions to prevent increases in dissolved copper concentrations.¹ The implementation actions are contained in the *Copper Action Plan*,² and have subsequently been incorporated into discharge permits as appropriate. With regard to copper from automobile brake wear debris, discharger “support” of the Brake Pad Partnership is included as a baseline action for the copper control strategy.

As a part of addressing the impairment listings for copper in the San Francisco Bay North of the Dumbarton Bridge, the RWQCB is developing site-specific objectives for copper and an implementation plan supporting those objectives. It is anticipated that the implementation plan will include measures similar to those in the implementation plan for the Bay south of Dumbarton Bridge, including support for the Brake Pad Partnership. The Bay Area dischargers’ participation in and support of the Brake Pad Partnership, in conjunction with

¹ San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) 2002. Staff Report on Proposed Site-Specific Water Quality Objectives and Water Quality Attainment Strategy for Copper and Nickel for San Francisco Bay South of the Dumbarton Bridge. Prepared by Richard Looker, May 15, 2002.

² Tetra Tech, Inc., Ross & Associates Environmental Consulting, Ltd., and EOA, Inc. 2000. Copper Action Plan, Final Report, June 2000. Prepared for the City of San Jose.

the Bay Area Stormwater Management Agencies Association, has been critical to the progress we have made to date.

The collaborative nature of the Partnership is grounded in several key voluntary commitments: (1) brake pad manufacturers have committed to introducing new products if the Brake Pad Partnership determines that brake pad wear debris is a significant source of copper to the Bay; (2) regardless of the Partnership's findings with respect to copper, brake pad manufacturers have committed to incorporating the evaluation approach developed by the Partnership into their existing practices for designing products that are safe for the environment while still meeting the performance requirements demanded of these important safety-related products; and (3) all stakeholders have agreed to work collaboratively within the Partnership, and to not simultaneously sponsor, pursue, or promote adversarial legislative or legal action relating to brake pads.

I would like to convey several concerns I have regarding the Total Maximum Daily Load (TMDL) for Copper, Lead, and Zinc in Chollas Creek with respect to automobile brake pads as a source of copper in stormwater runoff. The proposed amendment specifies that copper from automobile "[b]rake pad wear is likely a significant urban nonpoint source of copper in Chollas Creek" (p. 48). However, this analysis relies solely on the 1992 study prepared by Woodward-Clyde, which the Brake Pad Partnership has determined has some serious technical flaws. The Brake Pad Partnership is now conducting the technical studies needed to understand the role of copper from automobile brake pad wear debris on stormwater and surface water quality. These technical studies are supported by a State Water Resources Control Board Coastal Nonpoint Source Pollution Control Program Grant, pursuant to the Costa-Machado Water Act of 2000 (Proposition 13). The grant supports the Partnership's voluntary effort to carry out a set of interlinked laboratory, environmental monitoring, and environmental modeling studies to understand the fate and transport of copper from automobile brake wear debris in the environment. The Partnership initiated work on these studies in October 2003 and plans to complete them in December 2006. Enclosed for your information is a copy of a recent update on the Brake Pad Partnership that provides additional detail on our progress.

Although the Brake Pad Partnership's studies will not be fully complete until December 2006, I would like to bring your attention to two important new studies regarding total estimates of copper from brake pads in urban areas that have been completed or are near completion. The first study was conducted by the Clean Estuary Project (not the Brake Pad Partnership) in 2004. The Clean Estuary Project is a partnership of San Francisco Bay Area dischargers, the San Francisco Bay Area Regional Water Quality Control Board, and several other regional entities who have come together to facilitate efforts to improve water quality in San Francisco Bay by providing financial and staff support for technical analysis and stakeholder outreach activities. This report—*Copper Sources in Urban Runoff and Shoreline Activities*—provides a comprehensive summary of copper sources in urban runoff and estimates of their relative magnitudes. A copy of the report, along with other information about copper sources and control measures, is available on the Internet at:
<http://www.tdcenvironmental.com/copperreduction.html>.

The second study—*Emissions from Brake Lining Wear in the San Francisco Bay Area*—is being conducted by the Brake Pad Partnership and is now available for technical review at

http://www.suscon.org/brakepad/pdfs/EstimatingCopperLoadingfromBrakeSources_draft04-08-05.pdf. Upon completion of the review, this report is scheduled to be finalized on May 31, 2005. The results of this study will be used by the Brake Pad Partnership as one of the inputs to the air deposition, watershed, and bay modeling studies to understand how copper in brake pad wear debris may affect short- and long-term concentrations of copper in surface waters.

The Chollas Creek TMDL also refers to the annual report of the Brake Pad Partnership that includes voluntarily reported information from the Brake Manufacturers Council on copper use in new vehicles by model year. I would like to clarify that these data are helpful in understanding trends in copper use in brake pads on new automobiles, however, they are not appropriate for use in and of themselves for mass loading calculations. The report is available at <http://www.suscon.org/brakepad/pdfs/CuUMP%20Final%20Report%2012-03-04.pdf> and contains a detailed explanation of the data and appropriate uses.

For additional information on the Brake Pad Partnership, please do not hesitate to contact me at 415-977-0380 x314 or sconnick@suscon.org. For additional background and perspective on the role the Brake Pad Partnership plays in the SF Bay RWQCB's approach to controlling copper in runoff and surface water, I encourage you to contact Richard Looker on the Board's staff at 510-622-2451 or rel@rb2.swrcb.ca.gov.

Thank you very much for the opportunity to have input on this important amendment to the San Diego Region's Basin Plan.

Yours truly,

Sarah Connick, Ph.D.
Associate Director

Enclosure (BPP Update – Spring 2005)

cc: Marcia Brockbank, San Francisco Estuary Project
Geoff Brosseau, BASMAA
Rodger Dabish, TMD Friction
Michael Endicott, Sierra Club
Connie Liao, Sustainable Conservation
Richard Looker, SF Bay RWQCB
Tim Merkel, representing friction material manufacturers
Kelly Moran, representing BASMAA
Jim Pendergast, US EPA Headquarters
Bob Peters, Akebono Corp.
Mark Phipps, Federal Mogul Corporation
Chris Shepley, Brake Parts, Inc.